PRACTICE EXAM 4 - MATH 112
DATE: Friday, November 30
INSTRUCTOR: George Voutsadakis

Read each problem very carefully before starting to solve it. Each question is worth 5 points. It is necessary to show your work. Correct answers without explanations are worth 0 points.

GOOD LUCK!!

1. Compute the following integrals using the general power rule or substitution:

   (a) $\int (1 + \frac{4}{x^2})^3 (\frac{1}{x^3}) dx$ (2.5 points)

   (b) $\int \frac{x^2}{\sqrt[3]{(1+x^3)^5}} dx$ (2.5 points)

2. Compute the following integrals using the exponential and the logarithmic rules or substitution:

   (a) $\int (5x^2 + 10x) e^{x^3 + 3x^2 - 7} dx$ (2.5 points)

   (b) $\int \frac{-e^{3x}}{2 - e^{3x}} dx$ (2.5 points)

3. Find the average value of the function $f(x) = 5 - x^2$ on the closed interval $[1, 3]$. (5 points)

4. Find the area of the region that is bounded by the graphs of $y = x^2$ and $y = 2 - x$ and $x = 0$. (5 points)

5. Approximate the area of the region under the graph of $f(x) = \sqrt{2 + x^2}$ from $x = 0$ to $x = 3$ by using the Midpoint Rule with $n = 6$. (5 points)

6. Find the volume of the solid of revolution formed by revolving the region bounded by the graphs of the equations $y = \sqrt{4 - x}, y = 0, x = 0$ around the y-axis. (5 points)